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## ***Avian Influenza H7N7 in Humans in The Netherlands***

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National Institute of Public Health  
and the Environment  
The Netherlands

03M-0212 Koopmans

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### ***Participants***

- ♦ National Institute of Public Health and the Environment (RIVM), Bilthoven
- ♦ Department of Virology, Erasmus Medical Centre Rotterdam
- ♦ Municipal Health Service
- ♦ National Co-Ordination Centre for Communicable Disease Control (LCI), Utrecht

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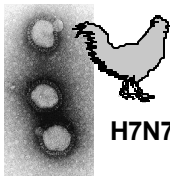
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### ***Outbreak of Avian Influenza Announced by Ministry of Agriculture on Feb 28th***



**H7N7 influenza virus**

***Is There a Risk to Human Health?***

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## ***The National Coordinating Structure for Infectious Diseases***

- ♦ Crisismanagement of outbreaks or threat thereof
- ♦ Development of uniform protocols for outbreak preparedness (e.G. smallpox, influenza)

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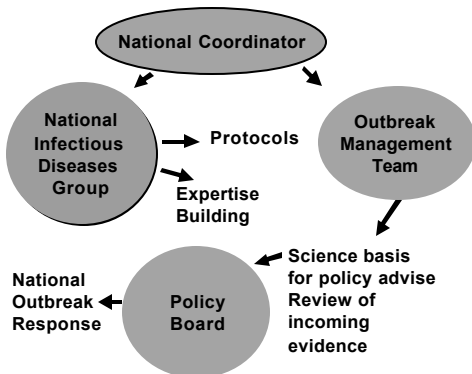
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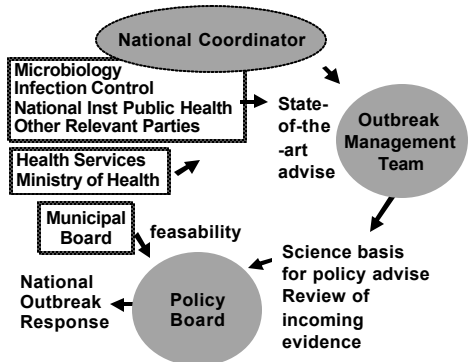
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### ***“Regular” Flu in Humans***

- ♦ Every Year
- ♦ 5-20% of the Community
- ♦ Some 2000 Hospitalizations
- ♦ On Average 800 Deaths

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### ***Pandemic Flu***

- ♦ Rare
- ♦ 30-50% of population affected
- ♦ Disease (much) more serious
- ♦ Numerous hospitalizations and deaths
  - *Spanish flu* (1918-20): 40 mln †
  - *Azian flu* (1957-58)
  - *HongKong flu* (1968-69)

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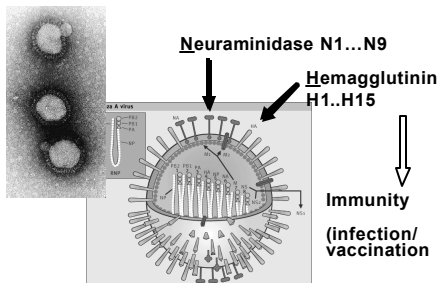
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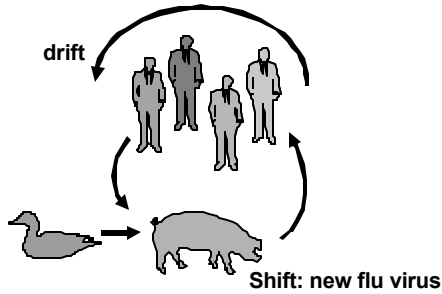
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## Flu Virus Antigenic Drift and Shift



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## Risk Assessment AI Transmission to Humans

- ♦ Few cases in humans despite high incidence in animals
- ♦ H5N1 Hong Kong 2003: 2 cases, 1 †
- ♦ H5N1 Hong Kong 1997: 18 cases, 6 †
- ♦ H9N1 Hong Kong 1999: 2 cases
- ♦ H7N1 Italië: no cases reported
- ♦ H7N7: possibly conjunctivitis

> Risk low but present

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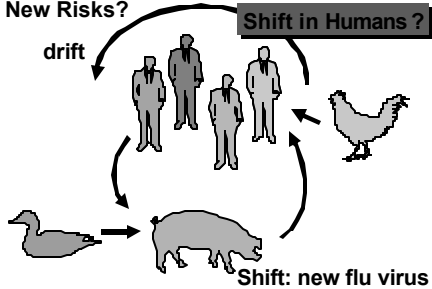
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## Flu Virus Antigenic Drift and Shift

New Risks?



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Date	Description	Symptoms	Lab
5 mrt	Vet	Conjunctivitis	negative
7 mrt	Vet	Conjunctivitis	H7N7
8 mrt	Vet	Conjunctivitis	No samples
8 mrt	Vet	ILI	H3N2
8 mrt	Several farmers?	Conjunctivitis	No samples

*Circulation of H7N7 AND H3N2 in same population  
Rumors on additional health complaints  
> OMT March 9*

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### ***Enhanced Surveillance of AI***

- ♦ Are other persons involved in screening, culling and care of infected poultry infected with AI?
- ♦ Can AI be transmitted between humans?
- ♦ Is there evidence of reassortment?
- > Active case finding in collaboration with regional health service and ministry of agriculture

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### ***Case Finding, March 10th***

- ♦ Health consultants at coordinating center for poultry culling
- ♦ Sampling and health questionnaires of persons with symptoms
- ♦ Screening by PCR and cell culture; typing by PCR
- ♦ Combined lab and epi database (case registry), daily updates for MOH

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### ***Preparing Sampling Kits (1)***



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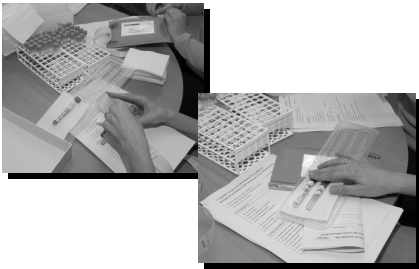
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### ***Preparing Sampling Kits (2)***



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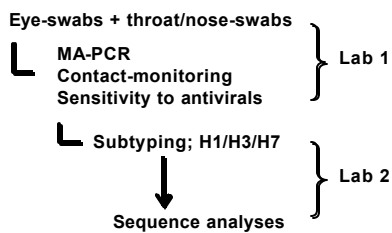
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### ***Sample Analysis***



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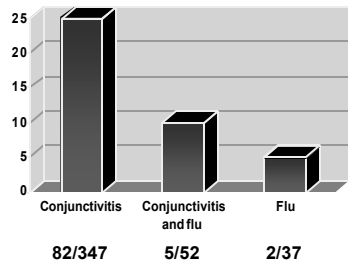
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### Proportion of Symptomatic Persons with H7 (N = 449)



Q3M-Q212.2: Koppelman

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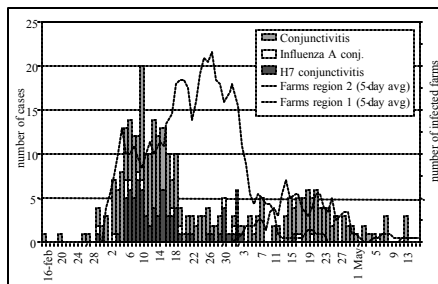
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### Conjunctivitis



Q3M-Q212.2: Koppelman

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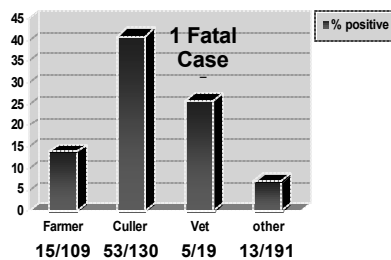
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### Distribution of Cases



Q3M-Q212.2: Koppelman

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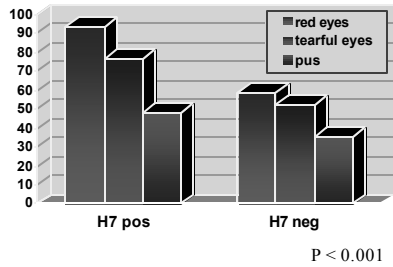
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### Symptoms Associated with Avian Flu



Q3M-Q212-2K Koppelman

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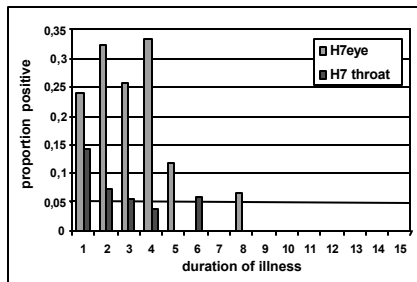
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Q3M-Q212-2K Koppelman

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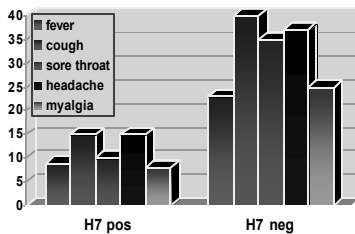
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### Symptoms NOT Associated with Avian Flu



Q3M-Q212-2K Koppelman

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## Containment Challenges



### National distribution

3 Polish poultry workers  
1 Belgian poultry worker

3 contacts infected

No overview of exposed

***IF spreading,  
difficult to contain***

Q3M-0212.2: Koppelman

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## Lessons Learned

- Fatal case - panic response
- Different interpretations of advice on protective measures
- Communication gaps between LNV and VWS
  - ***If not managed well, this could result in irrational measures***
- AI H7 in pigs
- No sustained surveillance of AI in pigs
  - Risk scenario for recombination

Q3M-0212.2: Koppelman

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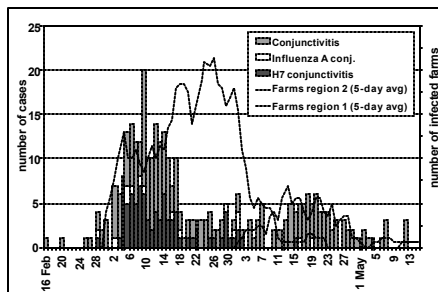
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## Conjunctivitis



Q3M-0212.2: Koppelman

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### ***Conclusions***

- ♦ Largest outbreak of human AI ever documented
- ♦ Coinciding with regular flu
- ♦ Risk of reassortment close to home
- ♦ Quick response (outbreak preparedness) but was it quick enough?

Q3M-0212.28 Koopmans

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### ***(Flu) Viruses Are Unpredictable***

***Preparedness Protocols  
Alone Don't Do the Trick:***

***They Need to be  
Rehearsed at Every Level  
of the Control Chain!***

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### ***Status April 16 (2)***

- ♦ Anti H7 HAR titers > 40 in 1-25% of sampled piglets (Gelderse Vallei)
- ♦ Jump of H7 into pigs would increase PH risk
  - Receptor adaptation
  - Reassortment
  - Zoonotic transmission commonly reported

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### ***Follow-Up***

- ♦ Seroprevalence in cohort poultry workers/farmers
- ♦ Risk factors for transmission?
- ♦ Seroprevalence and mucosal IR in confirmed cases and their contacts

0304-0212-3 Kaspermann

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